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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,295	01/26/2004	David B. Knowles	10052/4801	9290
26646	7590	10/13/2006	EXAMINER	
KENYON & KENYON LLP ONE BROADWAY NEW YORK, NY 10004			YAMNITZKY, MARIE ROSE	
			ART UNIT	PAPER NUMBER

1774

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/765,295

Applicant(s)

KNOWLES ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006 and 24 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-38 and 40-70 is/are rejected.
- 7) ☒ Claim(s) 5 and 39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. This Office action is in response to applicant's amendment received June 19, 2006, which amends the specification, and applicant's amendment received July 24, 2006, which amends claims 1, 2, 22, 23, 35, 36, 39, 50, 51, 55, 57 and 58.

Claims 1-70 are pending.

2. Page 3 of the reply received June 19, 2006 contains an error. Applicant instructs the Office to "replace paragraph [0040] on page 11 with the following amended paragraph:" and follows this instruction with an amended paragraph numbered [0041]. Page 2 of the reply also includes an amended paragraph [0040]. The amended paragraph bridging pages 3 and 4 appears to correspond to paragraph [0047] on page 14. The examiner has hand-corrected the paragraph and page numbers for this amended paragraph and will send the hand-corrected page for scanning into the IFW. However, the examiner suggests that applicant may want to submit a substitute specification (or at least new paragraphs [0040]-[0047]) incorporating the changes set forth in the June 19<sup>th</sup> amendment so as to avoid potential printing errors in the event the application issues as a patent.

3. Some of the issues raised under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, in the Office action mailed March 15, 2006 are overcome by claim amendment. Remaining issues are set forth below.

The rejections under 35 U.S.C. 102 and 103 based on Takiguchi et al. (WO 03/00661) or Takiguchi et al. (US 2003/0235712 A1) are overcome by claim amendment. Takiguchi's

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compounds must have a bridge formed between present R<sub>3</sub>' and R<sub>6</sub>. The possibility of such a bridge has been deleted from the claims.

The rejection under 35 U.S.C. 102 based on Brown et al. (US 2004/0086743 A1) is overcome by claim amendment. The specific ligand relied upon for the rejection under 35 U.S.C. 102 has a bridge formed between present R<sub>3</sub>' and R<sub>6</sub>, and is no longer within the scope of any of the pending claims.

The provisional obviousness-type double patenting rejection over claims 1, 16, 20, 35 and 39-41 of copending Application No. 11/002,188 is also overcome by the claim amendment deleting the possibility of a bridge between R<sub>3</sub>' and R<sub>6</sub>.

4. Claims 22-34 and 57-70 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Present claims 22-34 and 57-70 are broader than the original disclosure in that ring A is no longer required to have at least one nitrogen atom coordinated to a metal having an atomic weight greater than 40. These claims encompass subject matter outside the scope of the original disclosure.

This rejection could be overcome by amending claims 22 and 57 as follows:

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Claim 22: in the definition of ring A, in place of the previously deleted phrase “that is coordinated to the metal M”, insert --that is coordinated to a metal having an atomic weight greater than 40--.

Claim 57: in the definition of ring A, amend the phrase “that is coordinated to the metal M” to read --that is coordinated to ~~the metal M~~ a metal having an atomic weight greater than 40--.

5. Claims 2, 22-34, 36 and 57-70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 23 and 58: Per claims 1, 22 and 57, ring A can be optionally substituted with one or more substituents Z, which means that R<sub>4</sub>', R<sub>5</sub>' and R<sub>6</sub>' of the formula set forth in claims 2, 23 and 58 must be H or Z. The definition of R<sub>4</sub>', R<sub>5</sub>' and R<sub>6</sub>' as set forth in claims 2, 23 and 58 is not fully consistent with the definition of Z in claims 1, 22 and 57 in allowing R<sub>4</sub>', R<sub>5</sub>' and R<sub>6</sub>' to be optionally substituted by one or more substituents Z.

Claim 36: Per claim 35, ring A can be optionally substituted with one or more non-aromatic groups, which means that R<sub>4</sub>', R<sub>5</sub>' and R<sub>6</sub>' of the formula set forth in claim 36 must be H or a non-aromatic group. The definition of R<sub>4</sub>', R<sub>5</sub>' and R<sub>6</sub>' as set forth in claim 36 is not fully consistent with the definition of ring A in claim 35 in allowing R<sub>4</sub>', R<sub>5</sub>' and R<sub>6</sub>' to be aryl, heteroaryl, aralkyl and/or to be optionally substituted by one or more substituents Z (Z encompassing aromatic groups).

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Claims 22-34: The term “ligand” implies that the compound comprises a central atom (metal or otherwise) to which the structure shown in claims 22-26 and 30-34 is complexed/coordinated. However, all references to metal have been deleted from independent claim 22, and the only component positively defined for the compound of claims 22-34 is the ligand structure. It is not clear if the “ligand” must actually be complexed/coordinated to something else.

Claims 57-70: Proper antecedent basis is lacking for “the metal M” as recited in the definition of ring A in independent claim 57.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 6-25, 27-38, 40-60 and 62-70 are rejected under 35 U.S.C. 103(a) as being obvious over Brown et al. (US 2004/0086743 A1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter

disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

In Brown's published application, for example, see the abstract, Figure 6 and paragraphs [0028], [0052]-[0057] and [0068]-[0071].

The ligands as depicted by the formulae in Figure 6 are disclosed as representative photoactive ligands for an emissive material of the formula IV as shown in paragraph [0070]. The emissive material can be utilized in an emissive layer of an organic light emitting device comprising the emissive layer disposed between an anode and a cathode.

Brown et al. teach that the photoactive ligand may be a phenylpyridine, phenylisoquinoline or phenylquinoline ligand as depicted, for example, by the 1<sup>st</sup>, 18<sup>th</sup> and 19<sup>th</sup> formulae in Figure 6. These are ligands in which ring A is pyridine, quinoline or isoquinoline as taught in paragraph [0056]. Although the ring A of the ligands depicted in Figure 6 are not substituted at the position corresponding to R<sub>3</sub>' of the present formulae, ring A may be optionally substituted as taught in paragraph [0056]. Absent a showing of superior/unexpected results commensurate in scope with the present claims, it is the examiner's position that it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make

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compounds having ligands similar to those disclosed in Brown's Figure 6 and within Brown's disclosure in order to provide additional compounds suitable for the purposes of the prior art.

One of ordinary skill in the art at the time of the invention would have been motivated to make similar compounds with the expectation that similar compounds would have similar properties and could be used for the same purpose. One of ordinary skill in the art at the time of the invention would have reasonably expected that compounds having ligands similar to Brown's ligands of the 1<sup>st</sup>, 18<sup>th</sup> or 19<sup>th</sup> formulae in Figure 6, having a substituent on the nitrogen-containing ring would be emissive and could be used in the emissive layer of Brown's device.

With respect to the requirement of claims 8-21, 29-34, 42-55 and 64-69 for a methyl group at the R<sub>3</sub>' position, Brown et al. teach that the ring A may be substituted with an alkyl group. As would be recognized by one with general knowledge of organic chemistry, a methyl group is the simplest possible alkyl group.

8. Claims 1, 2, 22, 23, 35, 36, 56-58 and 70 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kamatani et al. (US 2003/0059646 A1) for reasons of record in the Office action mailed March 15, 2006 with the following correction.

References to Kamatani's compound No. "51" should read --54--.

9. Applicant's arguments filed June 19, 2006 have been fully considered as applicable to the rejections set forth in this Office action but they are not persuasive.

With respect to the rejection under 35 U.S.C. 103(a) based on Brown et al. and the rejection under 35 U.S.C. 103(a) based on Kamatani et al., applicant argues that the presently required compounds, which have substituents at the R<sub>3</sub>' and R<sub>5</sub> positions, provide increased device lifetime compared to compounds having a substituent at only one of these two positions. Applicant points in particular to paragraph [0082] and the table on page 39 of the present specification.

It is the examiner's position that the data of record do not demonstrate superior/unexpected results commensurate in scope with the rejected claims. While paragraph [0082] states that substitutions at both the R<sub>3</sub>' and R<sub>5</sub> positions provide a further improvement in device lifetime over substitution at only the R<sub>3</sub>' position or only the R<sub>5</sub> position, the examples set forth in the table on page 39 provide a comparison only between compounds having substitutions at both the R<sub>3</sub>' and R<sub>5</sub> positions, a compound having substitution only at the R<sub>3</sub>' position, and a compound having no substitution at the R<sub>3</sub>' and R<sub>5</sub> positions. No comparison is made with a compound having substitution only at the R<sub>5</sub> position.

Example 5, which utilizes an iridium compound having two phenylquinoline ligands, each substituted at both the R<sub>3</sub>' and R<sub>5</sub> positions, and an acetylacetonate ligand, has a better device lifetime (as measured by % luminance) than Comparative Example 1, which utilizes an iridium compound having two phenylquinoline ligands, each substituted at only the R<sub>3</sub>' position, but whether the improvement in device lifetime is significant is questionable.

Example 7, which utilizes an iridium compound having two phenylpyridine ligands, each substituted at both the R<sub>3</sub>' and R<sub>5</sub> positions, and an acetylacetonate ligand, has the same device

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lifetime as Comparative Example 2, which utilizes an iridium compound having two unsubstituted phenylpyridine ligands and an acetylacetonate ligand.

10. Miscellaneous:

Applicant is requested to verify whether “(d)”, “(e)” and “(f)” in lines 2-4 of claim 57 should be deleted.

Claims 1, 22, 35 and 57: In the line beginning “additionally or alternatively”, “from” should read --form--.

The claims that end with a formula should have a period inserted after the formula. The examiner did not previously note the missing period in these claims.

11. Claims 5 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Applicant’s amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY  
October 11, 2006



MARIE YAMNITZKY  
PRIMARY EXAMINER

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